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ABSTRACT

This article is an annotated bibliography listing and describing 79 publications pertaining to Internet-based instruction. Articles focus on topics such as the following: new technologies for educators and trainers, distance teaching strategies, intranets, virtual classrooms, online college degrees, and electronic performance systems. Collectively, the articles provide an introduction to the subject of online instruction and learning and offer advice to readers learning about training via the Internet. (Author/KC)

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Abstract

This article annotates a timely collection of 79 publications pertaining to internet-based-instruction. Articles focus on such topics as new technologies for educators and trainers, distance teaching strategies, intranets, virtual classrooms, on-line college degrees, and electronic performance systems. Collectively the articles provide the reader a solid introduction to the subject of on-line instruction and learning. They offer helpful advice to individuals beginning their first foray into cyber training.

Internet-Based-Instruction: An Annotated Bibliography

By

James J. Kirk Ed.D.

Anglin, G. J., Ed. (1995). "Instructional Technology: Past, Present, and Future. Second Edition". *Libraries Unlimited*, pg.431, ERIC no.ed395572.

Leading professionals in the field discuss instructional design and systems, computer applications in education and training, research and evaluation in instructional technology, future prospects for instructional technology, and professional development. The book contains six parts. A brief outline of instructional development and educational technology is given in part 1. This is followed by consideration in part 2 of the current state of the art, trends and issues, and challenges in linking the cognitive sciences with the instructional design process. Instructional development, including needs assessment and task analysis procedures are covered in part 3, and part 4 reviews various applications of instructional technology, such as the Internet and distance education. Parts 4 and 5 present an overview of current research and cover certification and professional development in the field. New to this edition are seven chapters that address such current topics as educational systems development and instructional systems development, postmodernism and instructional technology, interactive technologies, the Internet and higher education, qualitative research, and instructional technology and attitude change.

Armstrong, L. (1996). "Report on the Teaching and Learning on the Internet Projects--RMIT TAFE". Presented at the EdTech 1996 Biennial Conference of the Australian Society for Educational Technology, Melbourne, Australia.

This paper reports on the initial stages of developing training modules for study by students on the Internet in a course on local government. These training modules and their development are part of the "Teaching and Learning on the Internet Project" at the Royal Melbourne Institute of Technology (RMIT) (Australia). Some of the advantages of this type of training over traditional off-campus distance education are discussed along with its limitations. Preliminary issues in setting up training courses on the Internet are discussed, including costs and funding, teacher involvement in decision making, and designs that maximize ease of use and student interest. The elements of a successful approach to the delivery of online training are also summarized.

Bachler, C.J. (1997). "Technology delivers training in new ways". *Workforce*, 76, 98-99.

An increasing number of companies are starting to use technology as a training medium because it offers improved quality training, more consistent delivery and reduced training expenses. Furthermore, technology is the favored delivery tool for many trainees. One-on-one tutors may be more effective compared to technology-based training, but they are more expensive to implement and harder to schedule, which makes technology a more viable option. Technology-based learning is also advisable because it allows training to be administered over long distances. Distance learning, which may be conducted via mail, the Internet or videoconferencing, offers flexibility and minimizes the amount of time lost from work. Despite the benefits of technology, however, more conventional teaching is not likely to disappear any time soon. A combination of instructor-led teaching and technology-based learning may be the best solution.

Balch, D.E., & Patino, I. F. (1997). "Learning Online: A 20th Century Zen Experience". Paper presented at Annual Meeting of the Academy of Criminal Justice Sciences, Louisville, KY.

California's Rio Hondo Community College (RHCC) began developing on-line programs in response to rapidly approaching external changes affecting education and training. These changes included reduced funding for expansion, increased needs for inservice training, increasing numbers of adult students, and the growth of computer technologies and the Internet. Current distance learning applications allow colleges to combine new roles for teachers and learners, new learning paradigms, and technology that increases speed and accessibility. In developing the new program, however, planners at RHCC faced immediate resistance to change among faculty and staff. In addition, the following issues and obstacles had to be addressed: (1) gaining the support of key administrators; (2) convincing faculty, the Academic Senate, and the college's Curriculum Committee that distance learners would receive the same support and quality instruction as on-campus learners; (3) obtaining the support and assistance of colleagues in the target department; (4) assessing student needs and piloting courses; (5) maintaining adequate technology and deciding on elements to be implemented; and (6) allowing sufficient time to implement the program. The obstacles were overcome, however, and, as of 1997, 24 Web-based professional update courses related to peace officer education were offered through the college's Public Service department. The course pages include course titles, descriptions, learning goals, activities, assignments, and links to other Internet resources. Contains 18 footnotes.

Barron, A.E., & Orwig, G.W. (1995). "Digital Video and the Internet: A Powerful Combination". *Journal of Instruction Delivery Systems*, 9, 10-12.

Provides an overview of digital video and outlines hardware and software necessary for interactive training on the World Wide Web and for videoconferences via the

Internet. Lists sites providing additional information on digital video, on CU-SeeMe software, and on MBONE (Multicast BackBONE), a technology that permits real-time transmission of audio and video.

Barron, A.E., & Orwig, G.W. (1995). ERIC no.ed377825. "Multimedia Technologies for Training: An Introduction".

This guide introduces trainers, managers, and educators to a variety of new multimedia technologies now being used for presentation and training in business, military, and academic settings. The text describes advances in and implementation of technologies that range from wireless local area networks (LANs) and high definition television (HDTV) to audiographic teleconferencing and the Internet. A discussion of the issues and benefits of multimedia technology begins the text, followed by overviews of various technologies, including CD-ROM and compact discs, video technologies, digital audio technologies, LANs, telecommunications, teleconferencing and distance education, development software for training applications, and simulations and virtual reality. Each chapter begins with a scenario that illustrates implementation techniques for the technology, followed by background information, applications, and detailed graphics. Advantages and disadvantages of each technology are reviewed with the emphasis always on training applications. This guide may be used as either a resource book or a text, and each chapter can be used independently if desired. Contains references and additional suggested readings at the end of each chapter. A 20-page glossary defines relevant terms.

Brookshaw, C., & Seoane, D. (1996). "In a class all its own". *InfoWorld*, 18, 70-76.

Four approaches to Novell's authorized NetWare 4.1 Administration training are compared. The best approach is New Horizons' traditional classroom method, which offers several ways to learn. These include lectures, course books and a hands-on approach. The rapid pace of the class can produce information overload on the part of the participants. KeyStone Learning Systems' videotape-based approach is monotonous and uninspiring. The tapes may be useful as an addition to a classroom-based approach, but are not a complete solution by themselves. The Gartner Group's CD-ROM-based approach is effective, but requires extensive resources. The eight CD-ROMs are as effective in communicating information as the classroom approach. CBT Systems' computer-based training is more effective than videos, but limited in its approach. It lacks a course manual and does not provide a way to print out screen-based material.

Callaway, E. (1996). "The learning Web". *PC Week*, 13, 53-55.

Many corporations are now using intranets for training applications. General Motors is preparing to deploy four interactive Web-based training modules to parts and service managers in about 500 locations, with subjects ranging from how to run a dealership to fundamentals of automotive components. Web-based training (WBT) offers

a simple interface and works on multiple platforms, but bandwidth constraints tend to be a major problem and make it difficult to include rich multimedia. The WBT market is also immature; relatively few tools are available, and most current applications are home-grown. Early development products include Stanford Testing Systems' IBTauthor, Macromedia's Shockwave and AimTech's IconAuthor. A new class of tools is emerging that can deliver a rich, predefined WBT environment where users need only provide content.

Caudron, S. (1996). "Wake up to new learning technologies". *Training and Development*, 50, 30-35.

Companies are using new learning technologies for training, such as interactive multimedia, electronic just-in-time performance support, and the Internet. These methods change the role of the trainer to that of enabler of learning and performance enhancer.

Crenshaw, D. (1997). "'net training". *InfoWorld*, 19, 61-62.

Internet-based training has quickly become a cost-effective and timely way to update IS employee skills. The online courses are an offshoot of computer-based training (CBT), which has been used for years to allow people to learn at their own pace. Online classes may provide the same independent study as CBT or entail interaction with an instructor and other students. Fewer than 20 percent of companies currently use Web-based training, but more than 70 percent of respondents to a recent survey report that their organizations plan to implement Web-based training by early 1998. The Global Knowledge Network helped develop the Microsoft Online Institute, and it has worked with the Canadian government to create an online training center. The Mentys program offers technical courses on such topics as networking, programming, client/server, TCP/IP and Java. Bell Canada used the program to migrate from a traditional client/server network to an intranet and the Internet.

Curtin, C., & Canterucci, J. (1997). "Getting off to a good start on intranets". *Training & Development*, 51, 42-46.

Intranets are computer-based networks that allow companies to utilize Internet software tools and protocols to facilitate information-sharing and global communication within the confines of the organization. Unlike the Internet, users navigate through the system of one organization only, which is not accessible to outsiders. Intranets use a number of security features, such as passwords and firewalls, to keep themselves autonomous from the Internet. For training professionals, the benefits include the ability to provide an open standard for Internet delivery, the efficiency and ease with which training and performance support can be developed, and centralization of training administration and collection of trainee information. Guidelines on how to develop an intranet are discussed.

Denton, J.J., & Manus, A.L. (1995). "Accountability effects of integrating technology in evolving Professional Development Schools". Eric no.ed393443, p.6(1).

This analysis aimed at determining whether implemented technology systems and staff development with those systems at professional development schools have affected the academic performance of learners. Eight Texas elementary and secondary schools that in 1994-95 enrolled 5,337 students across 5 school districts comprised the sample for the study. These schools are members of a school-university collaborative project in which a technology infrastructure has been developed that includes nearly 300 microcomputers, 7 V-Tel compressed video systems, and connectivity to a Sun Sparc server linked to the Internet. University technology coordinators have provided technology training for classroom teachers and school administrators; additional staff development has been provided by technology specialists located at the schools. The Texas Assessment of Academic Skills Test (TAAS) was administered to measure academic skills in reading, mathematics, and writing. Although not every school yielded cumulative test results that were higher than the preceding year's scores, the trend in four of the sites shows that the impact of evolving technology on students and teachers as well as other possible factors have led to higher academic performance. A table shows student success indicators.

Dickinson, K. (1997). "Distance Learning on the Internet: Testing Students Using Web Forms and the Computer Gateway Interface". *TechTrends*; 42, 43-46.

Discussion of use of the Internet for distance learning examines non-traditional students, computer-based training programs, Computer Gateway Interface (CGI), creating tests on the World Wide Web, types of Web testing, programming and software, and the future of Internet-based instruction.

Dillon, N. (1997). "Internet-based training passes audit". *Computerworld*, 31, 47-48.

Coopers & Lybrand plans to debut the Tax News Network site that allows customers to easily and inexpensively get information on tax laws, as on-line education becomes more widely used. Analysts say on-line education will succeed if it is available at any time and in any location. The on-line training industry is forecast to reach $28 billion annually by 2001. Coopers & Lybrand plans to watch the sight closely because it believes user acceptance depends in large part on browser compatibility and quick downloads. Stanford University also plans an on-line program for its Education Program for Gifted Youth. The university hosts the sessions on its servers instead of outsourcing it. Stanford uses Centra Software's Symposium, as does MCI Systemhouse. Symposium combines legacy computer-based training programs, chat rooms, live application sharing and whiteboarding.

Dringus, L.P. (1995). "An Alterative Usability Evaluation Procedure for Interactive Online Courses". *Journal of Interactive Instruction Development*, 7, 10-14.

Discussion of the use of the Internet and World Wide Web for interactive distance education courses focuses on the importance of providing iterative usability evaluation of online courses and strategies to ensure effective online course presentation. Design heuristics are suggested, including feedback, help and documentation, and controls for group communication.

Driscoll, M. (1997). "Defining Internet-Based and Web-Based Training". *Performance Improvement*, 36, 5-9.

Describes the two broad categories of Internet-based training: text-only and multimedia. Discusses the following text-based only tools: e-mail, bulletin boards, and software downloading. Identifies four types of World Wide Web-based training, which include: Web computer-based training, Web-based employee performance support systems, and asynchronous and synchronous virtual classrooms.

Evans, L. (1995). "A legacy of learning". *Computer Weekly*, May 25, 48(1).

Training has become a significant factor in effective management with the proliferation of desktop systems, tighter regulations and potential law suits. Computer-based training (CBT) is one option suited to a variety of situations, including long-distance learning, computer-based subjects and simulations. The relatively low cost of PCs makes CBT a viable option for training long-distance when a centralized session is impractical, and for circumventing dangerous real-life training. Industry-specific software is lacking, but companies can use authoring tools to design courseware within a hypermedia format. CBT technology is evolving with additions such as digital video and audio being introduced. The potential for cooperative effort on a single document from different locations will also open new avenues for remote tutorials.

Farenga, S. J. (1996). "Prototype of a Procedural Knowledge Teaching Model". Paper presented at the Annual Conference of the New York State Association for Computers and Technologies, Catskill, NY.

The purpose of this study is to develop a model to teach procedural knowledge using the Internet. Over a 3-week period graduate level education students (N=10) were provided 12 hours of instruction and access to the Internet. Data collection methods included pre-workshop questionnaires, weekly journal entries, and post-workshop questionnaires. The preliminary questionnaire contained questions about teaching experience, computer background, level of familiarity with the Internet, expected use of the Internet for personal and professional development, predicted usage time on the Internet, and reasons for participating in the workshop. The teaching model involved

three phases: (1) direct group instruction; (2) tutoring; and (3) open exploration. The findings of the evaluation suggest several effective means of integrating Internet training into teacher education programs. The recommendations include anchoring instruction in an authentic activity, providing guided practice, integrating Internet training into a concise time frame, and minimizing overall instruction time.

Farquhar, J. et al. (1996). "The Internet as a Tool for the Social Construction of Knowledge". Paper presented at the National Convention of the Association for Educational Communications and Technology, Indianapolis, Indiana.

The use of computers as a tool for learning has traditionally focused on individualized methods of instruction. Social interaction, however, is taking an increasingly important role in current learning theories and instruction prescriptions including computer-based delivery systems. Concurrent with these recommendations, global computer networks have emerged bringing new forms of computer-mediated social interaction. This paper discusses an ongoing case study that takes advantage of Internet technology to promote learning through socially-mediated interactions. Based upon theories of situated learning and cognitive apprenticeship, students engage in social dialog with experts through Internet technologies such as e-mail, listservs, synchronous chats, and the World Wide Web. In this case, the experts were two multimedia developers, one academic and one corporate. They fielded questions related to the use of technologies for training from the class. (Contains 13 references.)

Filipczak, B. (1994). "Trainers on the Net". *Training*, 31, 42-51.

Looks at the growth of the Internet and its potential uses for trainers. Describes listservs and newsgroups that would be beneficial, the World Wide Web, and lists of resources that are helpful. Discusses the culture of the 'Net and training uses.

Filipczak, B. (1996). "Training on Intranets: The Hope and the Hype". *Training*, 33, 24-32.

Describes the development of corporate intranets (internal computer networks) and their potential use in training. Discusses computer-based training and how intranets are presently used more as tools than as training delivery systems. Includes a list of Internet-based resources.

Filipczak, B. (1997). "Are you wired enough?". *Training*, 34, 34-40.

Training using the World Wide Web technology is drawing increasing attention because it promises to increase training's accessibility, availability and reach. This type of training is usually conducted through an organization's 'intranet,' an internal computer

network similar to the Internet but is protected from public access by firewalls and other security devices. However, Web-based training (WBT) presents two significant challenges to companies. One is whether the firm has the bandwidth, the computers, the servers and the software to make WBT possible. The other is whether its employees are ready to be trained at their desktops and whether training managers are prepared for such an undertaking.

Fritz, M (1997). "WBT and CBT: the urge to merge?". *EMedia Professional*, 10, 54-55.

Developers of World Wide Web-based training (WBT) applications and techniques should concentrate on combining traditional classroom teaching methods with the advantages of computer-based training. WBT holds the promise of incorporating the real-time training that allows classroom training to retain its popularity, but WBT developers are to anxious to follow one or the other model. However, there are developments that indicate that WBT will receive the considered treatment of the technologies that went before it.

Fritz, M. (1997). "Is Web-based training new hype in old wineskins?". *EMedia Professional*, 10, 69-70.

The emerging technology of Web-based training (WBT) has the potential to replace computer-based training (CBT) as a training tool if its design is effective for users. WBT aims to provide programmed instruction like CBT but uses the Internet as its medium. Many WBT products do not accomplish the training task as well as CBT products because they focus on hype instead of utility. Another shortcoming for WBT is that it fails to use the helpful features found in CBT such as interactivity and feedback for the learner. WBT developers will likely design improvements to make WBT more useful.

Gantz, J. (1997). "Web-based training can help IT organizations". *Computerworld*, 31, 37(1).

Training is extremely important to successful IT implementations but tends to be neglected because project emergencies cut into training time, end users find themselves skipping classes and 'train the trainer' programs fail. Web-based training could solve many of these problems by combining the interaction available through a human instructor with the advantages of computer-based and CD-ROM training, such as multimedia and self-pacing. Some analysts say that the biggest obstacle to Web-based training is providing users with fast, reliable access, but such issues are not slowing the growth of the Internet or intranets in general. Getting major IT vendors to offer rich Web-based training applications may be a bigger obstacle; Microsoft's Online Institute boasts only a few dozen participating training providers, while Lotus' LearningSpace is so new

that it has even fewer. Vendors and users should jump on the Web-based training bandwagon as fast as possible to encourage its growth.

Gaspar, R.F., & Thompson, T.D. (1995). "Current Trends in Distance Education". *Journal of Interactive Instruction Development*, 8, 21-27.

Defines distance education; provides a historical background; discusses emerging modes of instruction, including interactive television, computer-mediated communication, electronic mail, and national and international networks; and considers the future of distance education, including the use of the Internet, multimedia, and a new paradigm for distance education.

Gillespie, T. (1997). "Web-ed for the information professional". *Database*, 20, 51-55.

Web-based education (Web-ed) meets a real need and represents a large emerging market. The Web-ed options range from for-credit classes at accredited universities to skill-enhancement classes offered by organizations such as Ziff-Davis University (ZDU). ZDU offers useful computing courses for just $4.95 a month. The process of taking a ZDU class is described.

Gillespie, T. (1998). "Creating the Virtual Classroom: Distance Learning with the Internet". *Library Journal*, 123, 134(1).

There is less technology here than in McCormack's book (above), but Porter presents a better conceptual approach to web education. She doesn't let either technology or reality get in her way as she discusses the possibilities and pitfalls. Porter examines the analysis and design issues for all types of distance learning and compares the use of teleconferencing, desktop video conferencing, and multi-user domains (MUTDS). She even looks at funding options. A good introduction, this is recommended for the managers who need to get an overview, write the grants, and hire the techies.

Glener, D. (1996). "The promise of Internet-based training". *Training & Development*, 50, 57-58.

The advent of the Internet is changing employee training programs. Because of this technology, training is shifting away from the static, linear format and embracing the fluid and individualized learning model. The use of the Internet in employee training offers several advantages. Training travel and related costs can be minimized, trainees from all parts of the world can share information and exchange ideas, training curricula can be changed and distributed easily, training materials become less expensive, information can be accessed 24 hours a day, and training can be customized. Internet-based training programs are not very costly to develop. All the hardware that a training department

would need are a server and modems for users. As for communications software, trainers can use inexpensive Internet browsers such as Microsoft's Explorer and Netscape's Navigator.

Goldberg, A. (1996). "Mr. Goodwrench's fix for making money on the Net". *PC Week*, 13, A8(1).

Training is an untapped market niche for those searching for ways to make money on the Internet. Training applications are ideally suited to the Internet, offering a financial and customer service edge. Companies can use the Internet to deliver information faster in a more intuitive format for better overall customer service. In addition, companies operating internationally will be able to transmit data easily over the Internet, avoiding the hassle of limited delivery areas. Moreover, using the Internet for training or information dispersion serves an obvious purpose and, therefore, is a justifiable cost. The tools necessary for training applications are already available, making the Internet a viable option. The Internet offers companies a way to improve their operations and reduce costs.

Green, K. (1997). "Internet Resources for Adult Educators". A publication of The Building Professional Development Partnerships for Adult Education Project, pg.29(1).

This document contains brief summaries of websites likely to be of interest to adult educators, as well as summaries of Internet listservs that adult educators may wish to join. The publication organizes the websites into the following 12 broad categories: (1) general adult literacy; (2) English as a second language; (3) workplace education and training; (4) family literacy; (5) technology; (6) professional development; (7) homeless education; (8) mathematics education; (9) educational research; (10) education information dissemination; (11) federal government; and (12) other interesting sites. The following literacy listservs are listed and described: National Literacy Advocacy List (NLA); LITERACY: WEC-L, NEAC-L, PRISON-L, NUMERACY, Adult Education Network (AEDNET); National Institute for Literacy (NIFL), and TESL-L.

Grissom, B.M. (1996). "Just passing through ... or not". *Adult Learning*, 8, 4-5.

Beverly McMurtry Grissom, the president of the AAACE, feels that satellite and optic technologies assist in the development of distance education. Work force development includes adult education programs. Adult education plays an important role in the case of the adults who undergo man-power training programs. Distance learning effaces the service delivery boundaries. A competition exists between the agencies which have acquired the technology to use the Internet for the purpose of distance education.

Gubernick, L.,& Ebeling,A. (1997). "I got my degree through e-mail". *Forbes*, June 16, 159, 84-89.

Distance learning is coming on fast, says management philosopher Peter Drucker. In 1993, Peterson's college guide listed 93 'cyberschools'; by contrast, the 1997 Distance Learning guide lists 762. According to InterEd, a higher education researcher, 55% of 2,215 four-year colleges and universities in the US are already offering courses off-site. More than a million students are already connected to virtual college classrooms, and that number is expected to triple by the year 2000. For students, advantages include an ability to attend school while working at a full-time job and living far from a college's campus. Distance learning has a potential to deliver economically efficient education, which is an increasingly important consideration as costs associated with traditional institutions of higher learning continue to rise.

Hamblen, M. (1997). "Budget drives savings". *Computerworld*, 31, 55-56.

Budget Rent A Car's customer service distance learning program relies on audio-conferencing and PC-based data sharing to train its representatives. The audio-conferencing program uses Latitude Communications' MeetingPlace hardware/software server combination that is priced at $39.95 per eight audio connections. Budget's students and instructors share applications via Stac's Reach Out software that is priced starting at $139. Budget's new training program costs $156 per student compared to the $2,200 formerly incurred per person for travel and expenses for two weeks of classroom training. Budget's system relies on an instructor in Lisle, IL to communicate with eight students spread throughout the nation via conventional analog telephone and voice connections. The instructor uses eight PCs connected with analog modems over standard telephone lines to monitor each student's computer-based car rental forms.

Hawkins, D.T. (1997). "Web-based training for online retrieval: an idea whose time is coming". *Online*, 21, 68-69.

Web-based training (WBT) efforts need to help students develop skills, allow time to practice the new skills, test students and track their development. WBT is a viable alternative to standard training efforts because it allows users to learn from remote locations and is not limited by class size, scheduling conflicts or room capacities. Developing WBT courses requires close collaboration between the course developers and Web page designers. Successful WBT courses provide accurate content and up-to-date hyperlinks.

Hequet, M. (1996). "Short of help?". *Training*, 33, 80-82, 84-87.

Widespread labor shortages are leading companies to adopt innovative recruiting and training methods, such as Internet job postings, computer-based training, certified

interviewers, collaborations with colleges and universities, and making employees at all levels feel important.

Hert, C.A. (1994). "A Learning Organization Perspective on Training: Critical Success Factors for Internet Implementation". *Internet Research*, 4, 36-44.

Argues that training is a critical success factor for Internet implementation in organizations, both in teaching Internet skills and in enabling trainees to participate in planning how the Internet could transform the organization. Conceptual areas relevant to the development of training and the associated theoretical perspectives are suggested (26 references).

Hoffman, T. (1997). "Disparate firms share in training". *Computerworld*, 31, 69-70.

United Technologies has been using long-distance employee training provided by Rensselaer Learning Institute (RLI) for its 160,000 employees since.1992. United Healthcare has also started using RLI's training services for its 29,000 employees including staff in remote locations such as Ireland and Africa. United Healthcare customized a 7.5-hour Lotus Notes 4.1 course into two multimedia sessions, each lasting 2 hours. An RLI instructor presented the seminars which were specifically focussed on modules tailored to employee needs. The computer-based courses eliminated long introductions and unnecessary details that were irrelevant to employee needs. Prior to the introduction of the new training program, the company was spending about $2.3 million for training without any strategic approach.

Hopey, C.E., & Ginsberg, L. (1996). "Distance Learning and New Technologies: you can't predict the future, but you can plan for it". *Adult Learning*, 8, 22-23.

The model of distance learning incorporates new technologies suiting the educational needs of the adult learners, and planning should be done in advance without waiting for the future to make it successful. The model of distance learning will enhance the traditional classroom-based models of distance education by fostering group learning environment. Adult education will benefit with the increased access to learning resources made available through Internet and multimedia databases. Learning will become collaborative and will connect the world of work and home.

Horowitz, A. (1997). "net train, net gain?". *Computerworld*, 31, 63-64.

Internet-based training (IBT) has been discussed for years but is still more a promise than a reality. Many IS managers are reluctant to employ IBT because it is new and unproven, but a growing number plan to adopt the technology soon. IBT is similar to

computer-based training (CBT) in that it is self-paced and nonlinear, but provides more interactivity because the training computer is connected to an internal or external remote server. It lets students ask questions via E-mail, get immediate feedback and interact via online chat sessions. Instructors can also hold an electronic version of regularly scheduled 'office hours.' Users say IBT combines the advantages of CBT with much of the interaction an on-site instructor provides and that a well-designed IBT curriculum can make it easier to track student progress. Among the best IBT applications are programming and other technical subjects. IBT can save training costs for large groups. Experts caution that IBT is not for everyone and suggest a modular approach.

Hoyt, B.R., Stockman, M., & Thalmann, J. (1997). "Design and Implement Custom Electronic Performance Support Systems (EPSS) for Training in Project Based Classes". Paper presented at the Summer Conference of the Association of Small Computer Users in Education (ASCUE), North Myrtle Beach, SC.

Electronic Performance Support Systems (EPSS) use computers to capture, store, and distribute knowledge in both an interactive and non-linear delivery. Using technology sources such as the Internet, Microsoft's Net Meeting, Connectix's color camera, and business software, it is possible to provide multiple site delivery and bring business education training closer to the workplace. These tools help students and business participants reach their highest potential performance quicker and with a reduced amount of faculty or training department support. In project based classes there are exciting opportunities for advanced problem solving in actual business situations that can be facilitated by advanced technology application. This paper describes a pilot project in the delivery of business training for university business students. A project-based program maximizes experiential learning and matches learning while doing. The benefits of experiential learning fall into four categories: (1) connecting theory and practice; (2) integration of learning; (3) use of knowledge and application of business concepts; and (4) learning to learn, including collecting and evaluating data, self directed learning, logical thinking, and reflection. Student participants exhibited better retention of knowledge areas, higher levels of motivation, and an ability to more effectively transfer their learning to other application areas.

Huff, W.D. (1997). "Distance learning". *Geotimes*, 42, 28(1).

An innovation in instruction has commenced with distance learning. The physical distance between teacher and student is bridged by utilizing technological means such as e-mail, video, voice or print. The students can study the lessons provided by the institution at their own pace. The major drawback of distance learning is the lack of two-way communication. There is also the tendency for verbal exchanges to become more complex.

Joseph, L. (1995). "Off We Go Cybernetting--Staff Development Makes the Difference". *MultiMedia Schools*, 2, 36-39.

Describes how to create a school or district model for an Internet staff development training program for integrating information access skills into the school curriculum. Highlights include instructional design; facility development, including computer workstations; hands-on workshops that include electronic mail, gopher, and downloading; follow-up training; and evaluation.

Kerka, S. (1996). "Distance Learning, the Internet, and the World Wide Web". *ERIC Digest*, pg.4(1), eric no.ed395214.

Some of the newest methods of distance learning (DL) use the Internet and the World Wide Web. DL on the Internet usually takes one of the following forms: electronic mail; bulletin boards/newsgroups; downloading of course materials or tutorials; interactive tutorials on the Web; real-time, interactive conferencing; "intranets" (internal, limited-access websites); or informatics. Advantages of delivering DL on the Internet include the following: time and place flexibility; potential to reach a global audience; no concern about compatibility of computer equipment and operating systems; quick development time; easy updating of content; and usually lower development and operating costs. Some disadvantages are limited bandwidth and slow modems that hamper delivery of sound, video, and graphics; reliance on learner initiative; information overload; access; and social isolation. Multimedia/hypermedia contexts support constructivist approaches to learning. Computer discussion also requires and facilitates learning-how-to-learn skills. Social isolation can be a drawback, but learning communities are developing in cyberspace. Online courses often feature consensus building and group projects, through which learners can develop skills in collaborating with distant colleagues and cooperating with diverse individuals--skills increasingly needed in the global workplace. To help learners make effective use of DL methods, skilled facilitation by teachers is essential (Contains 13 references).

King, J. (1997). "Teaching over the 'net". *Computerworld*, 31, 59-60.

Corporate education programs are replacing live instructors with Internet-based training programs. Research by the American Society for Training and Development reveals a 13% decline in the instructor-led training programs balanced by growth of Web and CD-ROM training programs, respectively, of 87% and 53%. Cost-effectiveness makes the trend toward 'distance learning' likely to continue, as does the ability to send a consistent message to large numbers of employees. Bandwidth limitations on corporate LANs have kept implementation somewhat in check. Lucent Technologies, MCI Communications and Boeing are examples of large corporations shifting to electronic training programs.

King, J. (1997). "Training just a click and a download away". *Computerworld*, 31, 69-70.

Street Technologies uses data compression and streaming technology to deliver multimedia-based training over corporate LANs, corporate intranets and the Internet. Among the topics covered are industrial safety requirements and desktop software. The material is sent from a central server of the network, so no CD-ROMs are needed, and sound cards are not required for the PCs because users can download Internet-based plug-ins for listening to the audio of the training programs. KPMG Peat Marwick tested the technology in a LAN-based training program for Microsoft Word, but not all the company's PCs have sound cards, so it is installing a corporate intranet and providing all workers with Internet access. Web-based training based on plug-ins means no sound cards need be acquired and installed in the PCs, and the company also saves on travel expenses. Gartner Group multimedia analyst Bob Gill says companies will link Internet-based training with course management and human resources systems to help managers find people with the right mix of skills for specific jobs.

Kramer, B.J. (1997). "New possibilities for distance learning". *Computer*, 30, 53-55.

Distance learning could act as a possible innovation model for the changes needed to adapt education to an information society. With the Web, an increase in networked personal computers and inexpensive multimedia equipment, the limitations of traditional distance education can be overcome. Several research projects are making improvements in many areas, such as FerbUniversitat's Virtual University System.

Kruse, K. (1997). "Five levels of Internet-based training". *Training & Development*, 51, 60-61.

The emergence of inexpensive Internet technologies has enabled training professionals to effectively conduct training and provide support to their trainees via the Internet. The advantages of Internet-based training (IBT) are universal language, easy and affordable distribution, fresh content, and cheap technology. Five basic levels of IBT have been developed. The first level involves the facilitation of communication between trainers and trainees while the second is described by the creation of a complete online library of hyperlinked references. The third level involves the automation of the administration of tests and surveys while the fourth is about the distribution of computer-based training. Finally, the fifth level offers delivery of interactive multimedia in real-time across an organizational network.

Kruse, K., & Feldstein, M. (1997). "Exploring multimedia Internet-based training". *Training & Development*, 51, 55-56.

Technological developments have made possible the idea of multimedia Internet-based training (IBT). These training programs, which involve the use of sound and video, are more complicated than text-based courses. Any company can start their own IBT today, with less expensive and wider bandwidth allowing for easier development in the near future. In acquiring the right bandwidth, companies should determine how much bandwidth they have, how much they need and how costly it is to purchase more. IBT requires more bandwidth than intranet-based training. For companies that expect their IBT program to be useful for more than a year, the multimedia format is recommended. With advances in technology, now is the time for companies to experiment with varied training possibilities.

Lyons, D. (1995). "Good grades for on-line education". *Computerworld*, 29, 141(1).

IS professionals who have tried online education report that they obtained better education via the Internet compared to classroom-based courses, and the Internet training is less expensive. In the past, online courses were used by people who could not spare the time or money to take traditional classroom classes. One IS professional indicates that online courses are more beneficial because they last longer than typical classroom courses and enable participants to really learn information. A regular five-day classroom-based course does not provide as much time to ask questions. Online courses enable participants to do labs and exercises at their own pace. Meeting online is less intimidating so participants are more likely to ask questions. One caveat is that online students need to have good time management skills.

Mende, R. (1995). "Training Faculty for Internet Delivery". Paper presented at the Instructional Technology Conference of the Colleges of Applied Arts and Technology of Ontario, Canada.

In June 1995, Cambrian College, in Ontario, Canada, began to train faculty for a new Internet-based Teachers of Adults Certificate program, utilizing electronic mailing lists as virtual classrooms and enrolling its first students in October of that year. Faculty were recruited for their experience in delivering courses through more conventional distance methods, such as teleconferencing and independent study. In the first step of the training, faculty were provided with hard copies of materials discussing the configuration of the PINE electronic mail software system, essential commands and functions, and characteristics of mailing lists and listservs. In addition to these training documents, 13 online training files were distributed to the participants and an electronic mailing list was established. The online files allowed the faculty to enjoy themselves while learning some of the significant conventions of the online community. Towards the end of the program,

participants were given a test which asked them to obtain an updated list of the subscribers to the course mailing list, determine the participation of subscribers, and e-mail individuals who had not participated in the past 24 hours. Of the 15 faculty members who committed to the training program, 8 completed it, allowing the new certificate to be implemented on schedule.

Moskowitz, R. (1995). "Wired U." *Internet World*, 6, 60-61.

Features four organizations that offer elementary, secondary, and postsecondary distance education courses. Topics include contracting with schools to convert their courses to an interactive environment, interactive courseware, testing, electronic discussion groups, and professional training. Notes distance education resources available on commercial online services.

Munger, P.D. (1997). "High-tech training delivery methods: when to use them". *Training & Development*, 51, 46-47.

Training can be delivered via conferencing and the Internet. Conferencing is used in training when individuals at different locations are required to interact with one another. Asynchronous computer conferencing should be used when the participants are in varying time zones or have dissimilar work schedules, when the topic needs individual study and collective discussion, or when team building among individuals from different locations is necessary. Video teleconferencing is advisable when simultaneous training is needed for individuals in widespread locations. Meanwhile, two-way digital teleconferencing is recommended when a high level of visual and auditory interaction is needed among participants and instructions at separate locations. Lastly, Internet-based training is best when Internet-savvy trainees are divided by time, schedule and location. This is also good for computer-based training and other distance-learning training.

Pask, J.M., & Snow, C.E. (1995). "Undergraduate Instruction and the Internet". *Library Trends*, 44, 306-17.

Describes several projects that integrate the Internet and specific Internet resources into undergraduate teaching and learning. Problems are discussed, including trying to retrieve specific and useful information, questions of reliability and accuracy of information, the need to become more user friendly, and demands on libraries for training and instruction.

Paul, L.G. (1997). "The right formula for training." Datamation, 43, 96-101.

A variety of new technologies are available to deliver more effective IT training. Timing is particularly important when teaching personnel novel IT skills. Training too

early means that workers are likely to forget the information and to require costly refresher courses. Training that comes too late means that IT workers will depend too heavily on the help desk. Now, IT training is being provided in chunks, and the training is available when it is needed by users. Traditional instructor-led training (ILT) often is now being combined with new alternative methods such as Web-based training (WBT), which is more flexible, faster and cheaper than traditional training methods. ILT still makes sense when a major technology change is being implemented, and computer-based training can then be used to relate to daily IT jobs.

Picard. D. (1996). "The future is distance training". *Training*, 33, S3-5.

Distance learning has become a very popular training concept. Also dubbed as distance training, it has achieved widespread acceptance as a result of rapid technological innovations and intensifying corporate demand to reduce costs related to sending employees to faraway locations. Distance training is expected to become more common in the near future. According to forecasts, it will grow exponentially for three reasons: the substantially reduced costs of technology, increased pressure to lessen training costs, and greater need to expedite and improve the quality of information distribution. However, there are two factors that can undermine the continued growth of distance training. They are the front-end costs and the unwillingness of the present generation of trainers to learn how to apply the new technology.

Rakes, G. (1996). "Using the Internet as a Tool in a Resource-Based Learning Environment". *Educational Technology*, 36, 52-56.

This article describes the concepts of information literacy and resource-based learning as they relate to the Inquiry Training Model of instruction. It also provides guidelines for designing lesson plans using the Internet as a resource and assesses learning outcomes.

Rand, A. (1996). "Technology transforms training". *HR Focus*, 73, 11-13.

The traditional classroom-based, facilitator-led training approach is being driven into obsolescence by several factors. These include the growing diversity of the workforce, the globalization of business, the geographical dispersion of personnel, the streamlining of HR departments, and the active learning styles of the MTV generation. These developments are creating new training needs that HR departments can meet by using smart technology. Smart technology can provide 'any-time, anyplace' learning, customize training experiences and cater to the different learning styles of the new breed of employees. Five useful applications of such technology for employee training are reviewed. These are interactive, computer-based training and multimedia CD-ROMS; network-based learning systems, such as Internet and intranets; distance learning systems;

training administration and management systems; and electronic performance support systems.

Read, H.P, III (1996). "Various Uses of Interactive Multimedia on the Internet". *Journal of Instruction Delivery Systems*, 10, 6-8.

Describes three Internet projects that use interactive multimedia: Internet-based training, intranet information management, and partnered marketing services. Development processes, strategies for utilizing emerging software tools, and techniques for converting existing training and knowledge into Internet-compatible formats are discussed.

Richardson, E.C. (1995). "Internet Cum Laude". *Internet World*, 6, 38-41.

Discusses the Internet's role in colleges and universities. Topics include network development, accessing the library's online catalog; attracting students, electronic student handbooks, coursework information, and program listings, teleconferencing, distance education, independent study and online degrees, electronic field trips, journalism periodicals, and electronic discussions on coursework.

Rosen, D. (1996). "How Easy Is It for Adult Educators To Use the Information Superhighway?". *National Institute for Literacy*, p10(1), eric #ed392964.

In November 1995, an online survey was conducted of 113 adult literacy practitioners who were actively using the Internet. Respondents reported the following difficulties encountered in learning to use the Internet: purchasing and learning to use hardware or software; getting access to a telephone line; getting an Internet account; learning account commands; accessing the Internet provider server; and learning to use various Internet features. They reported the following kinds of supports and training as helpful in overcoming these difficulties: hands-on experience; a friend or colleague; manuals, guides, or printed instruction; training workshop(s); technical assistance by telephone; online technical assistance by electronic mail, a message forum, or in real time; a "techno-buddy" assigned to help by telephone or in person; and course(s). These Internet features were used, in order of priority: electronic mail, listservs, World Wide Web, gopher, uploading/downloading files, newsgroups, and file transfer protocol. The Internet was used for adult education activities such as: electronic mail exchange with colleagues; using listservs or message forums/newsgroups to get and share information about practice or policy; searching databases for information; research; work on projects with colleagues; reading online magazines or journals; reviewing teacher-made curricula or lesson plans; helping students; looking for paid or volunteer work opportunities; and searching online news databases for adult education-related information. (Contains six tables.)

Rubin, B.A., & Sorohan, E.G. (1994). "Theme: The Internet". *Training and Development*, 48, 24-32,34-37.

Includes "The Internet: Where Few Trainers Have Gone Before" (Rubin); "The Attractions of the Internet" (Sorohan); and "Trainers' Network on the Net," a discussion of the Training and Development listserv (TRDEV-L) with its founder, David Passmore.

Ryan, S., & Leith, D. (1995). "Training with the Web: Internet Training in an Academic Library Environment". *Australian Library Journal*, 44, 22-26.

Describes the first phase of an Internet overview training program presented to academic staff at the University of Sydney (Australia). The use of locally created Hypertext Markup Language documents is explained, and an evaluation of the program indicated the success of using World Wide Web browsers as an aid in training.

Schaaf, D. (1997). " A pipeline full of promises: Distance training is ready to deliver." *Training*, 34, A6-17.

The virtual training of employees located in remote sites is on the verge of becoming a reality for corporations because of technological advancements that will soon make it possible to transmit to any site a secured package of voice, data and video electronically in an efficient, reliable manner. This low-cost system would allow firms to cut training budgets while improving their training programs by moving substantial training material quickly from one location to another, however remote. Increasingly limited resources are making it prohibitive to train the labor force and constantly update them through traditional means. Thus, distance training provides a cheap delivery system that will quickly supply required data where and when it is needed.

Shankar, G. (1997). "IBTauthor delivers computer-based training over the World Wide Web". *InfoWorld*, 19, 44L(1).

Stanford Testing Systems' IBTauthor 1.2 collection of tools for developing both intranet- and Internet-based training (IBT). The application, which is priced starting at $3,995, provides a Web standards-based framework for easily and quickly developing simple courses. However, IBTauthor is not a good choice as an enterprise-class tool because it currently lacks complex branching and quiz-creation elements, as well as scalable performance. Also, documentation needs improvement. Users will find that installing the IBTauthor CD-ROM is not complicated. The product is made up of three modules: IBToutliner is used to create course content, IBTmaker is used to compile and prepare a course for delivery, and IBTclass provides for course access. One plus with IBTauthor is that users do not have to learn a novel scripting language. In addition, IBTauthor offers drag-and-drop authoring.

Shein, E. (1997). "Anywhere, anytime". *PC Week*, 14, 115-116.

Distance learning via the Web is a popular topic due to colleges and universities across the US starting to offer more credit courses online. Hard facts are not easily found, but the Alfred P. Sloan Foundation has already given nearly $20 million for asynchronous learning projects at 40 colleges. Big firms are interested in distance learning. For example, US Air, Chase Manhattan Bank and Clorox are providing courseware materials on intranets so users can take part in Web-based training from PCs, while Cigna has an asynchronous partnership with Drexel University. Typically, a distance learning environment is made up of workgroup programs, such as Lotus Notes. The application includes courseware content and provides interactive features for communicating with classmates and instructors and creating discussion threads. Web-based training typically involves extending a firm's intranet to provide courseware. Critics charge Web-based training will not succeed unless users are Web-savvy.

Sheridan. D. (1996). "Can adults learn at a distance? And how well?". *Training*, 33, S12-19.

Distance training has the ability to help adults learn in a way that enhances their ability to assist their companies increase profitability or achieve their business goals. Most studies find that distance learning is comparable to traditional instructional media and methods, and sometimes can even perform better. In fact, it can be more interactive than conventional approaches. Experience reveals that it can only realize this potential if there is a right combination of instructional design, expert talent and delivery media. A skilled instructor should be present because this person is key to successful distance training. Such instructors should be highly skilled in their field and in the application of distance training technology.

Stammen, R.M. (1995). "Using Multimedia for Distance Learning in Adult, Career, and Vocational Education". *Eric Clearinghouse on Adult, Career and Vocational Education*, Information Series No. 362, eric #ed384828.

This paper explores how educators are using multimedia for distance learning, beginning with definitions of the concepts of multimedia, hypermedia, hypertext, distance education and distance learning. Three types of telecommunications technologies are described: multimedia with broadcast television, multimedia with interactive video (television), and computer-mediated communication networks. The educational opportunities opened up by the Internet and the emergence of the virtual classroom provide examples of the multiple options available for delivery of distance education. The paper examines some of the problems and issues raised by electronic influences and the technical, structural, and attitudinal barriers raised by resistance to technological developments. Instructional challenges and responsibilities that arise as these new technologies alter conceptions of teaching and learning are addressed. Suggestions for using multimedia with telecommunications technologies are presented. Options for using

an overhead optical viewer and descriptions of experiments around the United States provide detailed examples of creative uses of multimedia. Finally, the paper suggests what adult, career, and vocational educators need to know in order to use these technologies for effective instruction. The degree of facilitator skill and knowledge and the time and resources available all contribute to the effectiveness of distance instruction. Most important perhaps is the imagination required to envision the new ways of expanding human potential that these technological tools afford.

Steen, M. (1997). "Job satisfaction is more than money and status". *InfoWorld*, 19, 115(1).

An informal e-mail survey of IT professionals reveals that while becoming a CIO of a large enterprise remains the optimal IT profession, many respondents are more interested in flexible work hours, telecommuting and dealing with appreciative end-users. Many respondents also dream of working with innovative technologies such as networking, the Internet and the Web. Specific technology interests vary from multimedia to mainframes and although most of the professionals surveyed acknowledge that salary is an important dream-job component, educational assistance, training, state-of-the-art equipment and pleasant working environments weigh equally heavy in their cumulative list of desirable compensation. Many respondents also cite a varied workload as an important enticement for employee retention and several claim that mixing large and small projects helps to reduce job burnout.

Stewart, R.D. (1995). "Distance Learning Technology". *New Directions for Adult and Continuing Education*, 67, 11-18.

Describes distance technologies being used now, such as video networks, audiographic systems, the Internet and other computer networks, and interactive television. Suggests future needs: an increase in the level of interaction and more online support services.

Strunk, S.J., & Fowler-Frey, J. (1996). "ESL Online Action Research". Final Report. Institution: Pennsylvania Association for Adult Continuing Education, Lancaster-Lebanon Intermediate Unit 13, Lancaster, Pa. Sponsoring Agency: Department of Education, Washington, DC.

The report describes a project designed to meet professional development needs of Pennsylvania's practitioners in adult basic and literacy education by: (1) creating an infrastructure for guiding practitioners through classroom research with support from colleagues; and (2) linking practitioners through telecommunications. The project allowed ten English-as-a-Second-Language (ESL) educators to participate in action research with colleagues using the Internet as the primary communication vehicle, and coordinated with the National Professional Development Network for participation in an online action research database. As they pursued their projects, participants communicated regularly

with a participant-partner and joined in a virtual meeting online once a month. It is concluded that online action research holds great potential for ongoing professional development of adult educators, by creating a sense of community among practitioners, exposing them to a wealth of information in their field, and giving them a systematic way to examine practice. The report details the project's origins, design, and results relating to four themes: communicating with a partner; using technology in a new way; becoming a researcher; and unexpected outcomes. Appended materials include the training outline and summaries of seven research projects (Contains 22 references).

Sullivan, E. (1998). "The Web isn't always the best teacher". *PC Week*, 15, 36(1).

The best training method depends on what and whom the training is for. Despite the advantages of Web-based training, it is not always the best choice since some training programs require a human touch. Web-based training offer the advantages of convenience, cost-effectiveness and customization. Classroom training, on the other hand, allow teachers to adjust the curriculum according to the level of the trainees and monitoring progress is easier. Web-based training is more difficult to develop; most Web tutorials are static and boring because few teachers can develop a course in the nonlinear way that the Web requires. The best training method can be a combination of approaches: Web-based, classroom and utilizing the Web-based services of such companies as DigitalThink.

Thach, E.C., & Murphy, K.L. (1995). "Training via distance learning". *Training & Development*, 49, 44-46.

Distance learning offers many benefits. It is a cost-effective means of providing training, whenever and wherever needed, to employees in different geographic zones and employees who are not available or cannot waste time on conventional classroom training. To ensure the success of distance learning, trainers should match the technology with the training goals and approaches. For instance, attitude-based and performance-based goals that require interactive approaches call for interactive technologies such as on-line computer conferencing, videoconferencing, audioconferencing, and two-way satellite satellite transmission. On the other hand, if goals are cognitive and the approaches are presentation-based, noninteractive technologies such as printed materials, videotapes and one-way satellite transmission will suffice. In choosing the appropriate technology, trainers should also consider the cost, technical requirements and the number of participants.

Waltz, M. (1996). "Technologies reach beyond the campus". *MacWEEK*, Oct 14, 10, 23-24.

Schools are benefiting from linking to the Internet, along with using other types of mobile communications. Academic institutions are no longer insulated campuses. This is changing Apple's traditional dominance in the education-computing arena. The firm is

accommodating the change by focusing on the middle layer of applications with its QuickTime and CyberDog products that can accommodate many platforms. Traditionally, schools first use the Internet to publish course and administrative data, but many then use CGI products to link pages with programs, and professors are even creating Home Pages to distribute data to students and convey information. E-mail is very popular, providing a way for professors and students to communicate, and students at one college benefit from an interactive critique area on the Web. Other schools are implementing learn-by-modem programs, which allow users to communicate, attach files and send documents while taking a class online.

Wesley, M.T., Jr., & Franks, M.E. (1994). "The Virtual Classroom and Vertically Integrated Technology Training for Education: New Paradigms for Telecommunications Technology Training of School Personnel". Institution Name- PREPS, Inc., Mississippi State, MS.

Two new training and development initiative practices addressing telecommunications (Internet) training for education are presented: the Virtual Classroom and Vertically Integrated Technology Training (VERITTE). These techniques may be applied separately or in combination to develop competencies and positive attitudes among school personnel toward use of telecommunications in education. The Virtual Classroom seeks to apply telecommunications to enhance interconnectedness of classrooms, students, and teachers to each other and the outside world, thereby enhancing the learning resources of schools. It involves an elaboration of the electronic discussion group commonly implemented between individuals and groups on the Internet, and ideas are shared through the use of electronic mail and other electronic communication techniques. By engaging in active and cooperative learning experiences during training, teachers learn of the extensive information sources available to them and their students via telecommunications. VERITTE is a model for educational training and development which draws on Senge's concept of "the learning organization," an organization which is inherently systemic and non-hierarchical. Students, administrators, and teachers all: perform knowledge work toward the accomplishment of the organizations' goals; need to be competent in the use of the productive tools of the organization (computers, etc.) to perform their work; bring personal resources of skills and knowledge to the accomplishment of work; and are relied upon to bring a sense of their personal responsibility to their work performance. Through VERITTE, training and development activities simultaneously address all levels of the school organization in shared learning experiences. The paper also describes results of a pilot test of the Virtual Classroom and VERITTE in public schools. An appendix provides a transcript of an electronic discussion on the training and development practices introduced in this paper (Contains seven references).

Wildstrom, S. H. (1997). "Readin', writin', and the Internet". *Business Week*, no.3530 ,18.

American states and school districts must make provisions for teachers to be technologically trained to take advantage of the FCC's $2.25 billion in tax allocations for subsidized Internet access for schools and libraries. Despite mounting federal support to provide Internet access to schools, school systems lack vital training for teachers and administrators to apply the innovative technology to their respective curriculum. An Educational Testing Service study reveals that a mere 15% of teachers report gaining a maximum of nine training hours in educational technology. Well established programs geared at educating school officials include Co-NECT Schools, Global SchoolNet Foundation and NET schools. Co-NECT Schools programs, organized by the Educational Commission of the States and its new American Schools project, are implemented in 38 schools within seven states. Its prohibitive annual cost of $55,000 for each participating school, however, results in limited participation.

Wilkinson, S. (1995). "In a class by itself". *PC Week*, 12, E1-2.

Computer-based training (CBT) over the Internet provides users with several specific advantages, including the ability to update information rapidly. Placing training materials on the Internet allows companies to change them as frequently as every hour and eliminates the time and cost involved in distributing the materials via CD-ROM or floppy disk. Internet-based training has yet to take hold, but analysts believe it is about to explode. A survey forecasts that by 1999 the number of people using the Internet will rise to 200 million, more than double the number that use the Internet in 1995. New programming languages such as Java will also spur growth of Internet-based training, since they allow users to write programs for the network and permit linking of widely dispersed sources. The Internet is platform-independent, so training programs do not need to be modified for different computer systems.

Woods, J. (1996). "To Spin a Web: Job, Career, and Labor Market Information on the Internet". Paper presented at the National Occupational Information Coordinating Committee Meeting, Washington, DC, (NOICC Occasional Paper No.8).

This paper examines what the World Wide Web has to offer persons who work in education, employment and training, and career development. The guide is designed for the following purposes: (1) to provide "hot lists" of significant career and occupational information resources on the Web, with brief descriptions of what they offer and information on how to find them quickly; (2) to present online specific strategies and techniques to use in exploring the Web for topics and sites of interest; (3) to encourage greater use of the Web to obtain resources that might not be available or accessible in other ways; (4) to encourage users to evaluate Internet resources, based on their needs and applications, to determine their usefulness and appropriateness; and (5) to introduce beginning users to some pertinent Internet concepts and terminology. The guide is

organized in three chapters. Chapter 1 briefly introduces key concepts and tools that will help the reader to go online. Chapter 2 provides a concise but wide-ranging list of job search and career information and career development Web sites. Chapter 3 explores some sites that feature labor market, economic, and education data.

Wulf, K. (1996). "Training via the internet: Where are we?". *Training and Development*, 50, 50-55.

Uses of the Internet for training include electronic mail, bulletin boards, downloading of course materials, interactive tutorials on websites, and real-time conferencing using Multi-User Object Oriented Environments. Some companies use "intranets," internal corporate websites to deliver training.